

MGate™ MB3170/3270

1 and 2-port advanced serial-to-Ethernet Modbus gateways



- > Accessible by up to 16 TCP master/client devices, or connect to up to 32 TCP slave/server devices
- > Supports up to 31 or 62 serial slave devices
- > Ethernet cascading for easy wiring
- > Serial port routing by IP address, TCP port, or ID mapping
- > Serial redirector function provided
- > Embedded Modbus traffic monitor
- > 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC/ST connector)
- > Emergency request tunnels ensure QoS control



Overview

The MGate MB3170 and MB3270 are 1 and 2-port Modbus gateways, respectively, that convert between Modbus TCP, ASCII, and RTU communication protocols. The gateways provide both serial-to-Ethernet communication and serial(Master)-to-serial(Slave) communication. In addition, the gateways support simultaneously connecting serial and Ethernet masters with serial Modbus devices. The MGate MB3170 and MB3270 series gateways can be accessed by

up to 16 TCP master/clients or connect to up to 32 TCP slave/servers. Routing through the serial ports can be controlled by IP address, TCP port number, or ID mapping. A featured priority control function allows urgent commands to obtain an immediate response. All models are rugged, DIN-rail mountable, and offer optional built-in optical isolation for serial signals.

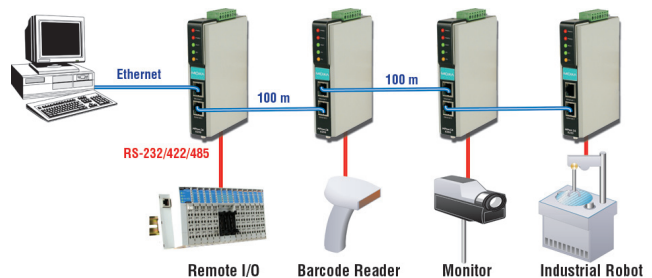
Integrate TCP Masters without Altering the Modbus RTU/ASCII Network or Software

The MB3270 can integrate Modbus TCP with Modbus RTU/ASCII, without modifying the existing Modbus RTU/ASCII architecture or software. With the serial redirector function, a serial master can

maintain direct access to serial slave devices through a specially mapped serial port. This allows the serial and TCP masters to access serial slaves simultaneously.

Cascade Ethernet Ports for Easy Wiring

Advanced models of the MGate™ MB3000 series have two Ethernet ports to make network wiring easier. Dual Ethernet ports allow users to string multiple Modbus gateways together using standard RJ45 Ethernet cables, eliminating the need for a separate Ethernet switch.



Redundant Power Inputs

Advanced models of the MB3000 series have dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources, so that continuous operation is provided

even if one power source fails. The higher level of reliability makes these advanced Modbus gateways ideal for demanding industrial applications.

Warning by Relay Output

A relay output is provided for the Ethernet link and power input status. The relay output gives maintenance engineers an additional tool for

troubleshooting and maintenance.

Optical Fiber for Ethernet Communication

The MGate MB3170 fiber series includes 100BaseFX fiber models that support transmission distances up to 4 km for multi-mode models, and up to 40 km for single-mode models. Optical fiber is well-suited for industrial applications because it is immune to electromagnetic

noise and interference. For environments that experience high ground loop voltages, fiber provides the best isolation protection, and because there is no danger of sparking, optical fiber is safer than copper wire to use in hazardous environments.

Priority Control for Urgent Commands (Patented)

As Modbus networks increase in size and complexity, the lag time between commands and responses becomes a major concern. Advanced models of the MB3000 series provide a priority control function for urgent commands, allowing users to force certain commands to get an immediate response. Depending on your system's requirements, different methods are available to define which commands receive priority.

Patent Numbers: (US/TW)

US7,743,192 B2 / I332618

US7,725,635 B2 / I321007

Specifications

Ethernet Interface

Protocol: Modbus TCP

Number of Ports: 2 (1 IP, Ethernet cascade)

Speed: 10/100 Mbps, Auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 kV (built-in)

Optical Fiber Interface

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-14 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km ^a 4 km ^b	40 km ^c
Saturation	-6 dBm	-3 dBm

a. 50/125 μm, 800 MHz*km fiber optic cable

b. 62.5/125 μm, 500 MHz*km fiber optic cable

c. 9/125 μm, 3.5 PS/(nm*km) fiber optic cable

Serial Interface

Protocol: Modbus RTU/ASCII Slave/Master

Number of Ports:

MB3170/3170I: 1

MB3270/3270I: 2

Serial Standards: RS-232/422/485, software selectable

Connectors:

MB3170/3170I: DB9 male for RS-232, terminal block for RS-422/485

MB3270/3270I: DB9 male x 2

Magnetic Isolation Protection: 2 kV (for "I" models)

ESD Protection: 15 kV for all signals

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ

Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 8

Stop Bits: 1, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)

Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND

RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Utility: MGate Manager for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2

Multi-master and Multi-drop:

Master mode: 32 TCP slaves

Slave mode: 16 TCP masters (request queue 32-deep for each master)

Support: Smart Routing, Serial Redirection, ProCOM, Priority Control, MXview, SNMP v1 (read only)

Physical Characteristics

Housing: Plastic, IP30

Weight:

MGate MB3170: 360 g

MGate MB3270: 380 g

Dimensions:

Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)

With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

Environmental Limits

Operating Temperature:

Standard Models: 0 to 60°C (32 to 140°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Altitude: Up to 2000 m (795 hPa), higher altitudes on demand

Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Power Requirements

Input Voltage: 12 to 48 VDC

Power Connector: Terminal block

Power Consumption:

MB3170: 435 mA @ 12 V, 218 mA @ 24 V, 109 mA @ 48 V

MB3170I: 555 mA @ 12 V, 278 mA @ 24 V, 138 mA @ 48 V

MB3270: 435 mA @ 12 V, 218 mA @ 24 V, 109 mA @ 48 V

MB3270I: 510 mA @ 12 V, 255 mA @ 24 V, 128 mA @ 48 V

Relay Output:

1 digital relay output to alarm (normal close): Current carrying capacity

1 A @ 30 VDC

Standards and Certifications

Safety: UL 508, EN 60950-1*

Hazardous Location:

UL/cUL Class 1 Division 2 Groups A/B/C/D,

ATEX Zone 2 Ex nA IIC T3 Gc, IECEx*

EMC: CE, FCC

EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A

EMS:

EN 55024

EN 61000-4-2 (ESD) Level 3

EN 61000-4-3 (RS) Level 3

EN 61000-4-4 (EFT) Level 4

EN 61000-4-5 (Surge) Level 3

EN 61000-4-6 (CS) Level 3

EN 61000-4-8 (PFMF) Level 1

EN 61000-4-11

Marine: DNV*

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

**Certification process is underway for fiber models. Please contact a Moxa sales representative for details.*

Reliability

MTBF (mean time between failures):

MGate MB3170: 210,794 hrs

MGate MB3270: 125,234 hrs

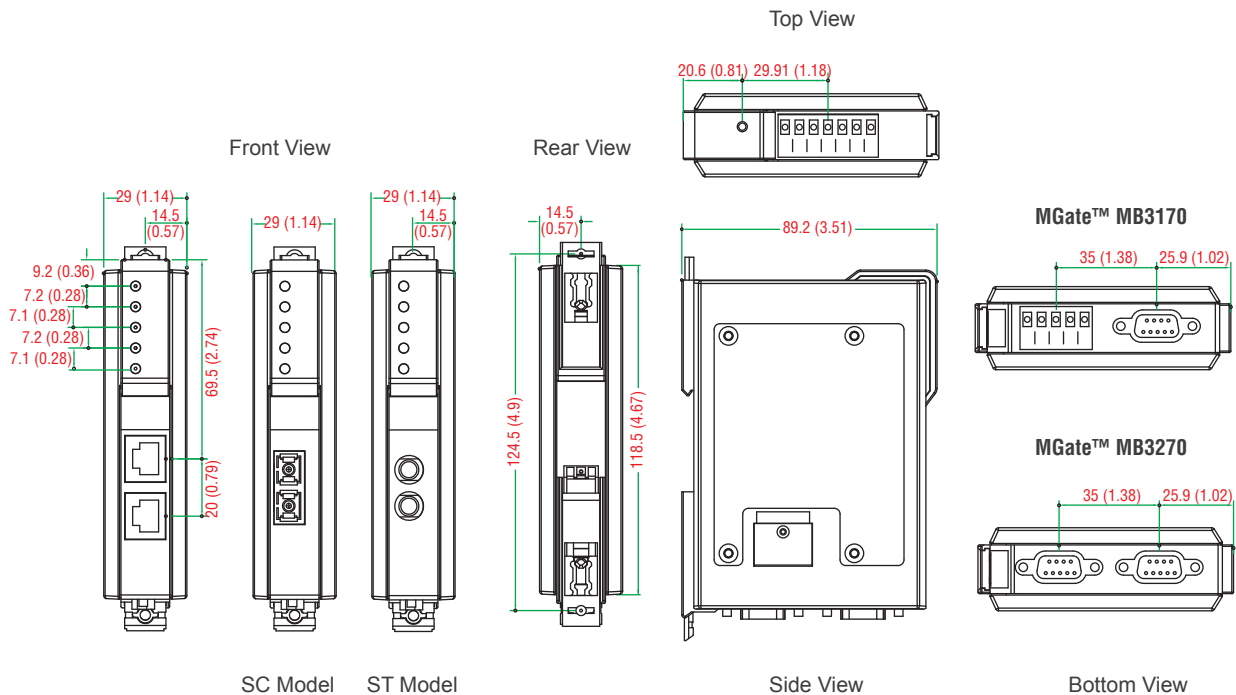
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

MGate MB3170: 1-port advanced Modbus gateway, 0 to 60°C operating temperature

MGate MB3170I: 1-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature

MGate MB3270: 2-port advanced Modbus gateway, 0 to 60°C operating temperature

MGate MB3270I: 2-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature

MGate MB3170-T: 1-port advanced Modbus gateway, -40 to 75°C operating temperature

MGate MB3170I-T: 1-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature

MGate MB3270-T: 2-port advanced Modbus gateway, -40 to 75°C operating temperature

MGate MB3270I-T: 2-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature

MGate MB3170-IE: 1-port advanced Modbus gateway, 0 to 60°C operating temperature, IECEx certification

MGate MB3170I-IE: 1-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature, IECEx certification

MGate MB3270-IE: 2-port advanced Modbus gateway, 0 to 60°C operating temperature, IECEx certification

MGate MB3270I-IE: 2-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature, IECEx certification

MGate MB3170-T-IE: 1-port advanced Modbus gateway, -40 to 75°C operating temperature, IECEx certification

MGate MB3170I-T-IE: 1-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature, IECEx certification

MGate MB3270-T-IE: 2-port advanced Modbus gateway, -40 to 75°C operating temperature, IECEx certification

MGate MB3270I-T-IE: 2-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature, IECEx certification

MGate MB3170-M-SC: 1-port advanced Modbus gateway with 1 100BaseF(X) multi-mode fiber port (SC connectors), 0 to 60°C operating temperature

MGate MB3170I-M-SC-T: 1-port advanced Modbus gateway with 1 100BaseF(X) multi-mode fiber port (SC connectors), -40 to 75°C operating temperature

MGate MB3170-M-ST: 1-port advanced Modbus gateway with 1 100BaseF(X) multi-mode fiber port (ST connectors), 0 to 60°C operating temperature

MGate MB3170I-M-ST-T: 1-port advanced Modbus gateway with 1 100BaseF(X) multi-mode fiber port (ST connectors), -40 to 75°C operating temperature

MGate MB3170-S-SC: 1-port advanced Modbus gateway with 1 100BaseF(X) single-mode fiber port (SC connectors), 0 to 60°C operating temperature

MGate MB3170I-S-SC-T: 1-port advanced Modbus gateway with 1 100BaseF(X) single-mode fiber port (SC connectors), -40 to 75°C operating temperature

MGate MB3170I-M-SC: 1-port advanced Modbus gateway with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 kV optical isolation, 0 to 60°C operating temperature

MGate MB3170I-M-SC-T: 1-port advanced Modbus gateway with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 kV optical isolation, -40 to 75°C operating temperature

MGate MB3170I-S-SC: 1-port advanced Modbus gateway with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 kV optical isolation, 0 to 60°C operating temperature

MGate MB3170I-S-SC-T: 1-port advanced Modbus gateway with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 kV optical isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes

DR-4524: 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input

DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input

DR-120-24: 120W/5A DIN-rail 24 VDC power supply with 88 to 132 VAC/176 to 264 VAC input by switch

Mini DB9F-to-TB Adapter: DB9 female to terminal block adapter

Package Checklist

- 1 MGate MB3170 or MB3270 Modbus gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card